

In the claims:

Claims 1-17 canceled.

18. (New) A filter for water, comprising a housing provided with an inlet branch pipe, an outlet branch pipe and a drain branch pipe with shutoff valves; a main filtration element composed of an ion-exchange material and having inlet and outlet surfaces for a liquid being filtered, said ion-exchange material of said main filtration element being volumetric with a predetermined geometric shape, is armored by a load-bearing reinforcement attached to a perforated support and forming a continuous porous framework of microglobules with pores of predetermined size in correspondence with parameters of cleaning, wherein the filtration mass volume of the material of said main filtration element is determined according to the follows expression:

$$V_f \frac{Q \cdot L^2}{k \cdot h_v} \text{ For a flat}$$

$$\text{filter } V_{cyl} = \frac{Q \cdot L^2 (L + d)}{k \cdot h_v \cdot d} \text{ for a hollow cylindrical filter;}$$

$$V_{con} = \frac{Q \cdot L^2 (2L + d_t + D_k)}{k \cdot h_v (d_t + D_k)} \text{ -for a conical filter;}$$

where Q is a required flow rate of the liquid being purified, kg/s;

L is a filtering layer thickness, mm;

d is an internal diameter of the cylinder filter, mm;

$d_k$  and  $D_k$  are internal diameters of an upper and a lower cross-section of the conical filter, mm;

$k = 0.12-0.14$  mm/s, is an experimental coefficient for the material with a spatial globular structure make;

an additional filtration correction protection layer covering an inlet surface of said main filtration element and composed of a finely grained substance introduced in form of powder via a loading valve in a housing cavity into a flow of filtration liquid deposited on said inlet surface of said main filtration element and dynamically retained on it by a liquid velocity head, so that a powder granule size is greater than a size of ion-exchange material pores, wherein an additional volume introduced depending upon a shape of the main filtration elements determined according to a following expression

$$V_{add} = HB\Delta, mm^2 \text{ for a flat filter;}$$

$$V_{add} = \pi H\Delta (D + \Delta), mm^3, \text{ for a cylindrical filter;}$$

$$V_{add} = H(R\Delta + r\Delta + \Delta^2), mm^3, \text{ for a conical filter;}$$

where H is a filtration element height, mm

B is a filtration element width, mm

D is a filtration element diameter, mm;

R is a radius of a lower conical base, mm;

r is a radius of an upper conical base, mm;

$\Delta$  is a required thickness of the protective layer, mm.

19. (New) A filter for water as defined in claim 18, wherein the filter is formed as a hollow cylinder.

20. (New) A filter for water as defined in claim 18, wherein the filter has an inlet surface and an outer surface with a ratio of said inlet surface to said outlet surface equal to 1.6-2.6.

21. (New) A filter for water as defined in claim 18, wherein the filter is formed as a cone.

22. (New) A filter for water as defined in claim 18, wherein said filter is formed flat.

23. (New) A filter for water as defined in claim 1, wherein said volumetric reinforcement is composed of a fibrous non-woven sheet material.

24. (New) A filter for water as defined in claim 23, wherein said fibrous non-woven sheet material is a synthetic winterizer.

25. (New) A filter for water as defined in claim 18, wherein said protection additional layer is composed of a filtration material which is a chemically active substance.

26. (New) A filter for water as defined in claim 25, wherein said chemically inert substance is perlite.

27. (New) A filter of water as defined in claim 18, wherein said filtration material of said protective additional layer is composed of a chemically active substance.

28. (New) A filter of water as defined in claim 27, wherein said chemically active substance is resorein-formaldehyde resin.

29. (New) A filter of water as defined in claim 18, wherein said additional protective layer has a material which corrects pH value of water being filtered and is composed of dolomite.

30. (New) A filter of water as defined in claim 18, wherein said additional protection layer is composed of a material with inclusion of a bacteriostatic substance.

31. (New) A filter of water as defined in claim 30, wherein said bacteriostatic substance is active silver.

32. (New) A method of manufacturing a filter, comprising the steps of preparing a reaction mixture of polymer-forming agents; conducting a reaction with obtaining a filtration element of a predetermined shape; during the preparing the reaction mixture first dissolving resorein in water, then warming up a solution up to 40°-50° C, then introducing a catalyst, steering up and adding formaldehyde after homogenization of the solution, holding at a room temperature until the solution gets turbid; pouring the obtained polymer solution into a mold with a perforated support and a load-bearing reinforcement being preliminarily installed in the mold; using the mold in form of a sheet non-woven volumetric material and fixed on a perforated support; thermostating the mold in two stages: first a polymer is to be held until a gel is generated at a pouring temperature and after that at a temperature of 80°-90°C; after cooling to a room temperature removing the porous ion-exchange element obtained from the mold and placing into a filter housing; filling the filter housing with a suspension of a

finely grained hydrophilous powder containing substances correcting properties of filtered water with a granule size greater than a size of ion-exchange element pores; bubbling the suspension; creating an easily breakable protection corrective filtration layer on an inlet surface of the filtration element by settling granules of the powder on an inlet surface of the element; and after its complete covering by a layer of a given thickness, retaining the layer by a velocity head of a flow; and after contamination removing the layer by a backflow of the liquid.

33. (New) A method as defined in claim 32; and further comprising carrying out the bubbling of the suspension of a finely grain powder by a flow of a liquid being filtered.

34. (New) A method as defined in claim 32; and further comprising carrying out the bubbling of the suspension by aeration of the liquid.

35. (New) A method as defined in claim 32; and further comprising for obtaining an element pore size equal to 0.001-0.02  $\mu\text{m}$ , taking an initial concentration of the polymer forming agents to be 50-40 mass % and a ratio of formaldehyde resorein equal to 2.5-1 moles, with a ratio of a number of cross-linking ether bonds to a number of methylene bonds being equal to 1.2,

and for generation of the protection layer taking a powder granule size equal to 0.03-0.3  $\mu\text{m}$  and a thickness of the protection layer of 0.01-0.5  $\mu\text{m}$ .

36. (New) A method as defined in claim 32; and further comprising for obtaining an element pore size equal to 0.02-0.2 $\mu\text{m}$ , taking an initial concentration of polymer-forming reagents to be 40-35 mass % and a ratio of formaldehyde-resorein equal to 2.0-1 moles, with a ratio of a number of cross-linking ether bonds to a number of methylene bonds being equal to 1.15; and for generating the protection layer taking a powder granule size equal to 0.3-4.0  $\mu\text{m}$  and a thickness of the protection layer to be equal to 0.05-0.2  $\mu\text{m}$ .

37. (New) A method as defined in claim 32; and further comprising for obtaining an element pore size equal to 0.2-0.3  $\mu\text{m}$ , taking an initial concentration of polymer-forming reagents to be 35-25 mass % and a ratio of formaldehyde-resin equal to 1.8-1 moles as a ratio of a number of crosslinking ether bonds to a number of methalene bonds being equal to 0.9; and for generation of the protective layer, taking a powder granule size to be equal to 4.0-10.0  $\mu\text{m}$  and a thickness of the protection layer to be equal to 0.2-1.0  $\mu\text{m}$ :

38. (New) A method as defined in claim 32; and further comprising, for obtaining an element pore size equal to 3.0-8.0  $\mu\text{m}$ , taking an

initial concentration of polymer forming reagents to be 25-20 mass % and a ratio of formaldehyde-reserin equal to 1.5-1 moles, with a ratio of a number of cross-linking ether bonds to a number of methylene bonds being equal to 0.8; and for generating the protection layer, taking a powder granule size equal to 10.0-25.0  $\mu\text{m}$  and a thickness of the protection layer equal to to be 1.0  $\mu\text{m}$  and over.



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